

Flex Monitoring Team Briefing Paper No. 22

Critical Access Hospital Year 4 Hospital Compare Participation and Quality Measure Results

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With funding from the federal Office of Rural Health Policy (PHS Grant No. U27RH01080), the Rural Health Research Centers at the Universities of Minnesota, North Carolina, and Southern Maine are cooperatively conducting a performance monitoring project for the Medicare Rural Hospital Flexibility Program (Flex Program).

The monitoring project is assessing the impact of the Flex Program on rural hospitals and communities and the role of states in achieving overall program objectives, including improving access to and the quality of health care services; improving the financial performance of CAHs; and engaging rural communities in health care system development.

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The Medicare Rural Hospital Flexibility Program

The Medicare Rural Hospital Flexibility Program (Flex Program), created by Congress in 1997, allows small hospitals to be licensed as Critical Access Hospitals (CAHs) and offers grants to States to help implement initiatives to strengthen the rural health care infrastructure. To participate in the Flex Grant Program, States are required to develop a rural health care plan that provides for the creation of one or more rural health networks; promotes regionalization of rural health services in the State; and improves the quality of and access to hospital and other health services for rural residents of the State. Consistent with their rural health care plans, states may designate eligible rural hospitals as CAHs.

CAHs must be located in a rural area (or an area treated as rural); be more than 35 miles (or 15 miles in areas with mountainous terrain or only secondary roads available) from another hospital or be certified before January 1, 2006 by the State as being a necessary provider of health care services. CAHs are required to make available 24-hour emergency care services that a State determines are necessary. CAHs may have a maximum of 25 acute care and swing beds, and must maintain an annual average length of stay of 96 hours or less for their acute care patients. CAHs are reimbursed by Medicare on a cost basis (i.e., for the reasonable costs of providing inpatient, outpatient and swing bed services).

The legislative authority for the Flex Program and cost-based reimbursement for CAHs are described in the Social Security Act, Title XVIII, Sections 1814 and 1820, available at http://www.ssa.gov/OP_Home/ssact/title18/1800.htm

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EXECUTIVE SUMMARY

Introduction

This report examines the fourth year participation and quality measure results for Critical Access Hospitals (CAHs) in the Centers for Medicare and Medicaid Services (CMS) Hospital Compare public reporting database for hospital quality measures.

Methods

This study used data on hospital participation and quality measure results for January to December 2007 from the Hospital Compare website. Due to the reporting schedule, data for a full calendar year is available from CMS at the end of the following September. These data were linked with data on all CAHs maintained by the Flex Monitoring Team, and with data on hospital characteristics from the Fiscal Year 2007 American Hospital Association Annual Survey. Participation was defined as reporting data on one or more quality measures for one or more inpatient discharges during 2007. Participation rates for CAHs were calculated by accreditation status, size, date of CAH conversion and ownership type.

The 2007 quality measure results for participating CAHs were compared by 1) accreditation status and ownership and 2) with those of rural and urban Prospective Payment System (PPS) hospitals. Results for all three groups of hospitals were also compared over time for 2005, 2006 and 2007 discharges. For each measure, the percent of patients in CAHs and PPS hospitals that received the recommended care was calculated by dividing the total number of patients in all hospitals in the group who received the recommended care by the total number of eligible patients in the group.

Results

For 2007 discharges, 69% of CAHs participated in Hospital Compare by submitting data for at least one patient on one measure. By state, the percent of participating CAHs ranged from 7.7% to 100%. Nine states had 100% of their CAHs participating. CAHs were more likely to report data on pneumonia and heart failure measures than on AMI and surgical infection prevention measures. The overall CAH participation rate of 69% for 2007 discharges compares to previous rates of 41% (2004); 53% (2005) and 63% (2006).

Similar to previous years, for 2007 discharges, CAHs did not do as well on the AMI and heart failure measures as rural and urban PPS hospitals. For pneumonia and surgical infection prevention, CAHs scored as well or better than other hospitals on some measures, and not as well on other measures. From 2005-2007, the percent of CAH patients receiving recommended care increased for nearly all measures. The percent of rural and urban PPS hospital patients receiving recommended care also increased. Thus, CAHs continued to have lower scores relative to rural and urban PPS hospitals on several measures.

Conclusions

The Office of Rural Health Policy (ORHP) encourages state Flex programs to work with CAHs in their states on quality improvement, measurement and reporting. An explicit focus on quality improvement was included in re-authorization of the Flex program in the Medicare Improvement for Patients and Providers Act passed by Congress in July 2008 (H.R. 6331).

The overall percent of CAHs participating in Hospital Compare has increased from 41% in 2004 to 69% in 2007, but varies considerably by state. Over the past four years, CAHs have improved their performance on nearly all Hospital Compare measures. At the same time, however, rural PPS and urban PPS hospitals also improved their performance. Thus, CAHs continue to have lower scores relative to rural and urban PPS hospitals on several measures, especially the AMI and heart failure measures. The persistence over time of significant differences between CAHs and PPS hospitals, especially for AMI and heart failure patients, as well as within the group of CAHs, presents an ongoing quality improvement challenge for CAHs.

CMS is continuing to add inpatient and outpatient measures to Hospital Compare. Some of the new and proposed measures address conditions that are commonly treated in CAHs (e.g., AMI Emergency Department/outpatient measures, HCAHPS patient assessment of care survey measures) while others address procedures not usually performed in CAHs (e.g., cardiac surgery). Future Flex Monitoring Team analyses will examine the extent to which CAHs are voluntarily reporting data on these new measures and assess trends in performance over time on all relevant measures.

INTRODUCTION

The Medicare Prescription Drug, Improvement and Modernization Act of 2003 established an incentive payment for eligible acute care hospitals paid under the Medicare Prospective Payment System (PPS) to report data on ten quality measures reflecting recommended care for acute myocardial infarction (AMI), heart failure and pneumonia, beginning with their 2004 discharges. The hospitals were also required to agree to have their data publicly displayed on the Centers for Medicare and Medicaid Services' (CMS) Hospital Compare website. Since that time, additional measures have been added for AMI, heart failure, pneumonia and surgical care improvement. PPS hospitals are required to collect and submit data on these measures for the Reporting Hospital Quality Data for Annual Payment Update (RHQDAPU) program or face a reduction in their annual payment update from Medicare.

Critical Access Hospitals (CAHs) were authorized as part of the Medicare Rural Hospital Flexibility Program passed in 1997. CAHs are small, rural hospitals that are either located 35 miles from another hospital (or 15 miles in areas with mountainous terrain or only secondary roads) or state-certified as necessary providers of care. CAHs may have a maximum of 25 acute care and swing beds, and must maintain an annual average length of stay of 96 hours or less for their acute care patients. As of July 2009, there were a total of 1,305 CAHs nationally. Unlike PPS hospitals, CAHs are reimbursed by Medicare on a cost basis, and do not have a financial incentive to submit quality measure data to Hospital Compare. CAHs can choose to submit data for any or all of the measures in the measure set. Although CAHs do not face the same financial incentives as PPS hospitals to participate, the Hospital Compare initiative provides an important opportunity for CAHs to assess and improve their performance on national standards of care. Improving the quality of care provided by CAHs is an important goal of the Medicare Rural Hospital Flexibility Program.

PURPOSE OF THIS PROJECT

The purpose of this project is to:

- Determine the percent of CAHs that are participating in the fourth year of Hospital Compare, identify key characteristics related to CAH participation, and examine reporting of measures by condition
- Compare the quality measure results for all participating CAHs with rural and urban PPS hospitals
- Analyze quality measure trends over time for CAHs and other groups of hospitals.

METHODS

This project used secondary data on hospital participation and quality measure results for January through December 2007 from the CMS Hospital Compare website (<http://www.hospitalcompare.hhs.gov/>). The Hospital Compare measures are based on data abstracted from patient records for hospital discharges. Due to the reporting

schedule, data for a full calendar year are available from CMS at the end of the following September. In September 2008, the most current data from the website for hospital discharges in 2007 were downloaded and converted to a database with one record for each participating hospital using SAS 9.2 statistical analysis software (SAS Institute Inc., Cary, NC). These data were linked with data on all CAHs maintained by the Sheps Center at the University of North Carolina as part of its Flex Monitoring Team activities, and with data on hospital characteristics from the Fiscal Year 2007 American Hospital Association (AHA) Annual Survey. The Hospital Compare data were linked to these data sources using Medicare provider numbers, AHA identification numbers, hospital names and addresses, and county FIPs codes.

Hospital Compare data for hospital discharges in 2004, 2005, and 2006 had been downloaded in September of the following years for previous analyses (Casey and Moscovice, 2006; Casey, Burlew and Moscovice, 2007; Casey, Burlew and Moscovice, 2008) and were also available for this analysis. Hospitals in the four databases were linked, using current and previous Medicare provider numbers (CAHs receive new Medicare provider numbers after converting), hospital name and ZIP code. PPS hospitals were classified as rural or urban based on their location in an Office of Management and Budget designated non-metropolitan (rural) or metropolitan (urban) county. Participation rates for CAHs were calculated by accreditation status, size, date of CAH conversion and ownership type.

The quality measure results for participating CAHs were compared with those of rural and urban PPS hospitals. Although the number of CAH patients for whom measures were reported had again increased since the previous year's analysis, many CAHs still had a small number of patients for several measures. Therefore, aggregate scores were calculated across all reporting hospitals in each subgroup. For each measure, the percent of patients in CAHs and in the other hospital groups that received the recommended care were calculated by dividing the total number of patients in all hospitals in the group who received the recommended care by the total number of eligible patients for each measure.¹ This method gives more weight to hospitals with more patients. Statistical tests were conducted to determine whether the differences in the proportions of patients in each group of hospitals that received the recommended care were statistically significant.

An alternative method of comparing the performance of CAHs and other hospitals is to calculate mean scores for each hospital individually, and then calculate an average for each subgroup. An advantage of this method is that each hospital contributes equally to the subgroups' means. However, this "average of averages" method can give a less accurate picture of the performance of a group of hospitals when a large number of the facilities have very small numbers of patients for the measures, as is currently the case with CAHs.

¹For example, if one hospital had 10 out of 20 patients and another hospital had 70 out of 100 patients receiving recommended care for a given measure, the aggregate score across the hospitals would be 67% (80 out of 120 patients). Using the alternative "average of averages" method, the score would be 60%, the average of 50% (10/20) and 70% (70/100).

RESULTS

CAH Participation in Hospital Compare

Table 1 shows the number of CAHs in each state as of December 2007 and the percent of CAHs that were participating in Hospital Compare for 2007 discharges. Overall, a total of 892 CAHs (69%) were participating in Hospital Compare, defined as submitting data for at least one patient for one measure. (This total of 892 does not include CAHs that submitted quality measure data to their Quality Improvement Organization and did not allow the data to be publicly reported to Hospital Compare).

By state, the percent of CAHs participating in Hospital Compare varies considerably, ranging from 7.7% to 100%. Of the 45 states with CAHs, three states had less than 25% participation; six states had between 25 and 50% participation; 14 states had between 51 and 75% participation; 22 states had over 75% participation, including nine states that had 100% of their CAHs participating.

Table 1
Critical Access Hospital (CAH) Participation in Hospital Compare by State
for 2007 Discharges

State ¹	Number of CAHs ²	Percent of CAHs Participating in Hospital Compare ³	State	Number of CAHs	Percent of CAHs Participating in Hospital Compare
Alabama	4	100.0	Nebraska	65	96.9
Alaska	12	16.7	Nevada	11	27.3
Arizona	13	84.6	New Hampshire	13	100.0
Arkansas	28	67.9	New Mexico	6	100.0
California	26	100.0	New York	13	61.5
Colorado	25	56.0	North Carolina	21	90.5
Florida	11	54.5	North Dakota	33	42.4
Georgia	35	60.0	Ohio	34	82.4
Hawaii	9	22.2	Oklahoma	33	87.9
Idaho	26	7.7	Oregon	25	84.0
Illinois	51	82.4	Pennsylvania	13	69.2
Indiana	35	82.9	South Carolina	5	80.0
Iowa	82	81.7	South Dakota	37	45.9
Kansas	83	59.0	Tennessee	16	68.8
Kentucky	30	93.3	Texas	74	33.8
Louisiana	27	33.3	Utah	9	66.7
Maine	15	100.0	Vermont	8	100.0
Massachusetts	4	50.0	Virginia	7	100.0
Michigan	34	55.9	Washington	39	53.8
Minnesota	79	74.7	West Virginia	18	100.0
Mississippi	27	48.1	Wisconsin	59	91.5
Missouri	36	77.8	Wyoming	14	100.0
Montana	46	56.5	All States	1291	69.1

¹Five states (Connecticut, Delaware, Maryland, New Jersey and Rhode Island) do not have any CAHs.

²Number of CAHs certified as of December 2007.

³Participation was defined as providing data on at least one patient for one measure.

Data sources: Hospital Compare data for 2007 discharges downloaded from CMS website September 2008 and Flex Monitoring Team CAH database.

The overall CAH participation rate of 69% for 2007 discharges compares to previous rates of 41% (2004); 53% (2005) and 63% (2006) (Figure 1).

Figure 2 shows the percent of CAHs that participated in Hospital Compare for 2007 discharges by date of CAH certification. From 2000 through 2005, between 140 and 225 CAHs were certified each year; only 19 CAHs were certified in 2006 and nine in 2007. CAHs certified in 1999 or earlier had the lowest Hospital Compare participation rate (51%), while those certified in 2005 had the highest rate (90%). The lower participation rate among the most recently certified hospitals is somewhat surprising, given that nearly all converted from PPS hospitals and presumably have the capacity to report.

All CAHs are limited to a maximum of 25 beds. On average, CAHs that participated in Hospital Compare for 2007 discharges had significantly more beds (23.2) than non-participants (20.7) and a significantly higher average daily census (24.0 vs.18.7) ($p < .0001$).

CAHs that were accredited by the Joint Commission or the American Osteopathic Association were more likely (82%) than non-accredited CAHs (64%) to participate in Hospital Compare (Table 2). The higher rate of Hospital Compare participation among accredited CAHs, which has been a trend since 2004, is not surprising, since the Joint Commission has required accredited hospitals to report performance measurement data since 2002, and it initiated public reporting of core measure data in 2004. While accredited CAHs are more likely to participate in Hospital Compare, the large number of non-accredited CAHs means that almost two-thirds of the CAHs that participated in Hospital Compare were not accredited.

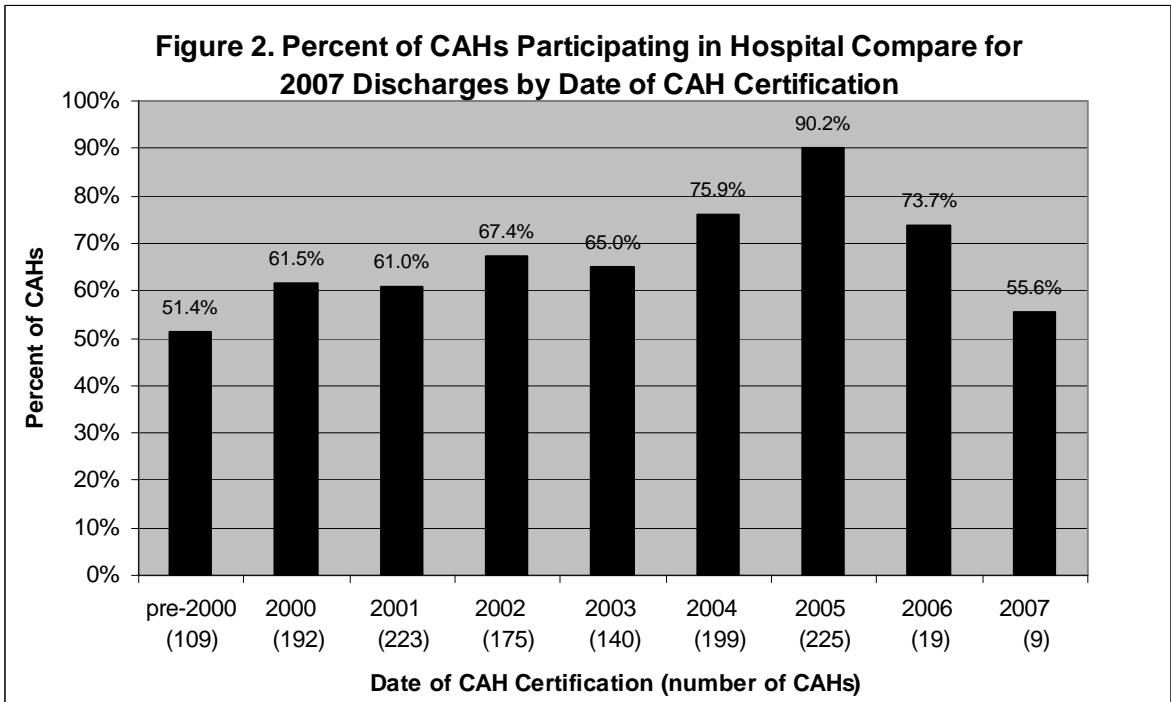
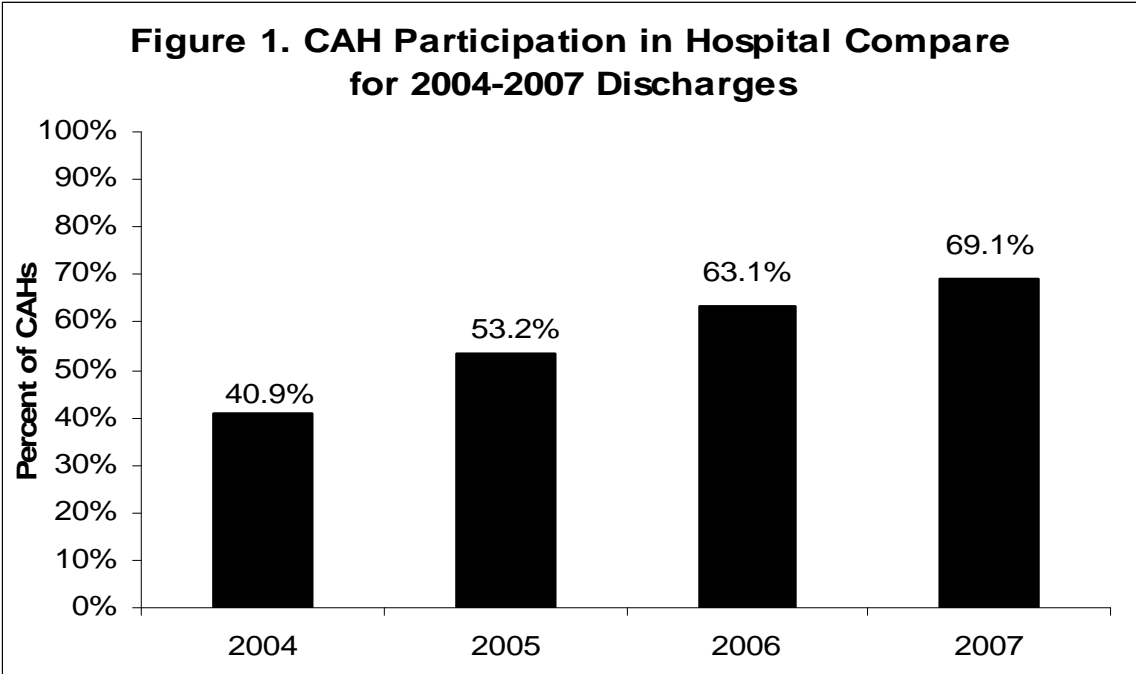
Seventy-six percent of private non-profit CAHs participated in Hospital Compare, compared to 63% of those with government/public ownership and 53% of for-profit CAHs.

Table 2
CAH Hospital Compare Participation by Accreditation and Type of Ownership
(N = 1,291)

	Total number of CAHs	Percent of CAHs that participate in Hospital Compare
Accreditation¹		
Accredited	381	81.6
Not accredited	905	63.9
Ownership¹		
Government/public	572	63.0
Private non-profit	666	76.1
For profit	51	52.9

¹The accreditation status of 5 CAHs and ownership type of 2 CAHs were unknown.

Data sources: Hospital Compare data for 2007 discharges downloaded from CMS website September, 2008; Flex Monitoring Team CAH database; FY 2007 AHA Annual Survey.



CAH Reporting of Measures by Condition

Figure 3 describes the process of care measures in the Hospital Compare measure set for 2007 discharges. This report presents data for CAHs on 23 measures. Data for the AMI percutaneous coronary intervention (PCI) measure were not included because the total number of CAH patients nationally was less than 25. PCI procedures require specialized equipment and cardiology expertise not usually present in CAHs. The children's asthma measures also were not included as no CAHs reported data on these measures.

Figure 3. Hospital Compare Measures for 2007 Discharges

<i>Heart attack/acute myocardial infarction (AMI) Measures</i>
<p>Aspirin at arrival – AMI patients without aspirin contraindications who received aspirin within 24 hours before or after hospital arrival.</p> <p>Aspirin at discharge – AMI patients without aspirin contraindications who were prescribed aspirin at hospital discharge.</p> <p>ACE inhibitor or ARB for left ventricular systolic dysfunction (LVSD) – AMI patients with LVSD and without angiotensin converting enzyme inhibitor (ACE inhibitor) or angiotensin receptor blocker (ARB) contraindications who are prescribed an ACE inhibitor or an ARB at hospital discharge.</p> <p>Beta Blocker at arrival – AMI patients without beta-blocker contraindications who received a beta-blocker within 24 hours after hospital arrival.</p> <p>Beta Blocker at discharge – AMI patients without beta-blocker contraindications who were prescribed a beta-blocker at hospital discharge.</p> <p>Fibrinolytic therapy received within 30 minutes of hospital arrival – AMI patients receiving fibrinolytic therapy during the hospital stay and having a time from hospital arrival to fibrinolysis of 30 minutes or less.</p> <p>PCI received within 90 minutes of hospital arrival – AMI patients receiving Percutaneous Coronary Intervention (PCI) during the hospital stay with a time from hospital arrival to PCI of 90 minutes or less.</p> <p>Smoking cessation advice/counseling – AMI patients with a history of smoking cigarettes who are given smoking cessation advice or counseling during a hospital stay.</p>
<i>Heart Failure Measures</i>
<p>Assessment of left ventricular function (LVF) – Heart failure patients with documentation in the hospital record that LVF was assessed before arrival, during hospitalization, or is planned for after discharge.</p> <p>ACE inhibitor or ARB for left ventricular systolic dysfunction (LVSD) – Heart failure patients with LVSD and without ACE inhibitor or ARB contraindications who are prescribed an ACE inhibitor or an ARB at hospital discharge.</p> <p>Discharge instructions – Heart failure patients discharged home with written instructions or educational material given to patient or caregiver at discharge or during the hospital stay addressing activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.</p> <p>Smoking cessation advice/counseling – Heart failure patients with a history of smoking cigarettes who are given smoking cessation advice or counseling during a hospital stay.</p>
<i>Pneumonia Measures</i>
<p>Oxygenation assessment – Pneumonia inpatients who receive an oxygenation assessment, arterial blood gas, or pulse oximetry within 24 hours of hospital arrival.</p> <p>Initial antibiotic timing – Pneumonia inpatients who received initial antibiotics within 6 hours after arrival at the hospital.</p>

Figure 3. Hospital Compare Measures for 2007 Discharges

<p>Blood culture performed in the Emergency Department prior to initial antibiotic received in hospital – Pneumonia patients whose initial Emergency Department blood culture specimen was collected prior to first hospital dose of antibiotics.</p> <p>Smoking cessation advice/counseling – Pneumonia patients with a history of smoking cigarettes who are given smoking cessation advice or counseling during a hospital stay.</p> <p>Appropriate initial antibiotic selection – Immunocompetent patients with pneumonia who receive an initial antibiotic regimen that is consistent with current guidelines.</p> <p>Influenza vaccination status – Pneumonia patients age 50 years and older, hospitalized in October through February who were screened for influenza vaccine status and vaccinated prior to discharge, if indicated.</p> <p>Pneumococcal vaccination status - Pneumonia inpatients age 65 and older who were screened for pneumococcal vaccine status and were administered the vaccine prior to discharge, if indicated.</p>
<p><i>Surgical Care Improvement Measures</i></p>
<p>Prophylactic antibiotic received within 1 hour prior to surgical incision – Surgical patients who received prophylactic antibiotics within 1 hour prior to surgical incision.</p> <p>Prophylactic antibiotic selection – Surgical patients who received the recommended antibiotics for their particular type of surgery.</p> <p>Prophylactic antibiotics discontinued within 24 hours after surgery end time – Surgical patients whose prophylactic antibiotics were discontinued within 24 hours after surgery end time.</p> <p>Surgery patients with recommended Venous Thromboembolism (VTE) prophylaxis ordered - Surgery patients with recommended VTE prophylaxis ordered anytime from hospital arrival to 48 hours after surgery end time.</p> <p>Surgery patients who received appropriate Venous Thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery - Surgery patients who received appropriate VTE prophylaxis within 24 hours prior to surgical incision time to 24 hours after surgery end time.</p>
<p><i>Children's Asthma Care</i></p>
<p>Use of Reliever Medication for Inpatient Asthma - Use of relievers in pediatric patients admitted for inpatient treatment of asthma.</p> <p>Use of Systemic Corticosteroid Medication for Inpatient Asthma - Use of systemic corticosteroid medication in pediatric patients admitted for inpatient treatment of asthma.</p>

Source: CMS, <http://www.hospitalcompare.hhs.gov/>, 2009.

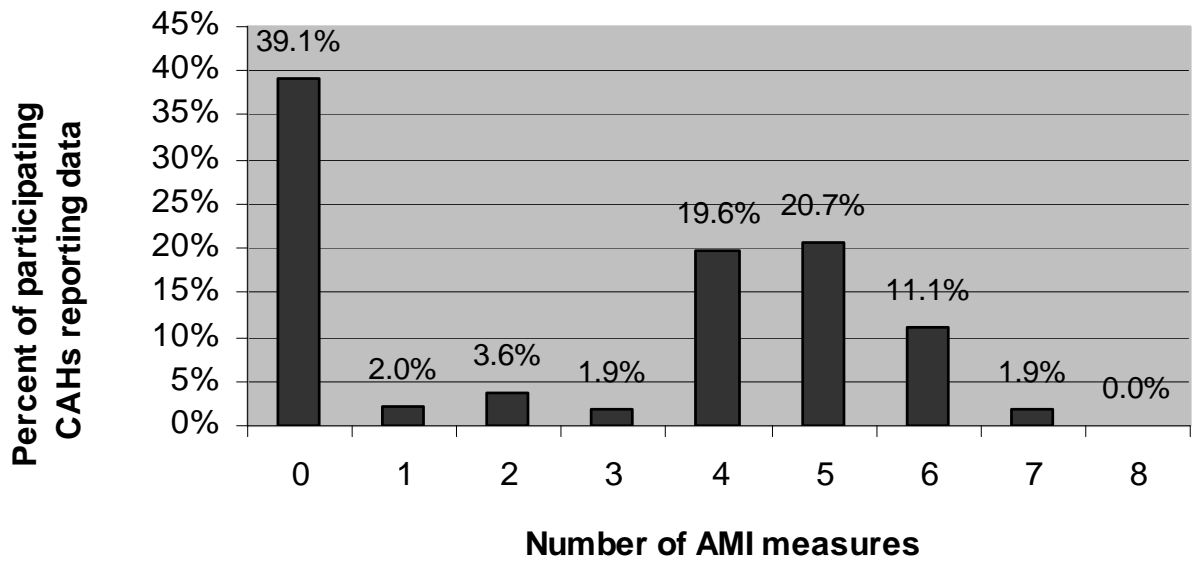
CAHs were more likely to report data on the pneumonia and heart failure measures than on the AMI and surgical improvement measures. (Reporting data was defined as having a denominator of one or more patients.) Over one-third (39%) of the 892 CAHs that participated in Hospital Compare did not report data on any of the AMI measures, while 53% reported data on four or more measures (Figure 4).

In contrast, 66% of the 892 participating CAHs reported data on all four heart failure measures, while only 7% did not report data on any heart failure measures (Figure 5).

Similarly, 76% of participating CAHs reported data on all seven pneumonia measures and an additional 14% reported data on six measures; only 0.6% did not report data on any pneumonia measures (Figure 6).

For the surgical care improvement measures, 57% of participating CAHs did not report data on any measures, while 36% reported data on all five measures (Figure 7).

**Figure 4. CAH Reporting of AMI Measures for 2007 Discharges
(N = 892 CAHs)**



**Figure 5. CAH Reporting of Heart Failure Measures for 2007
Discharges
(N = 892 CAHs)**

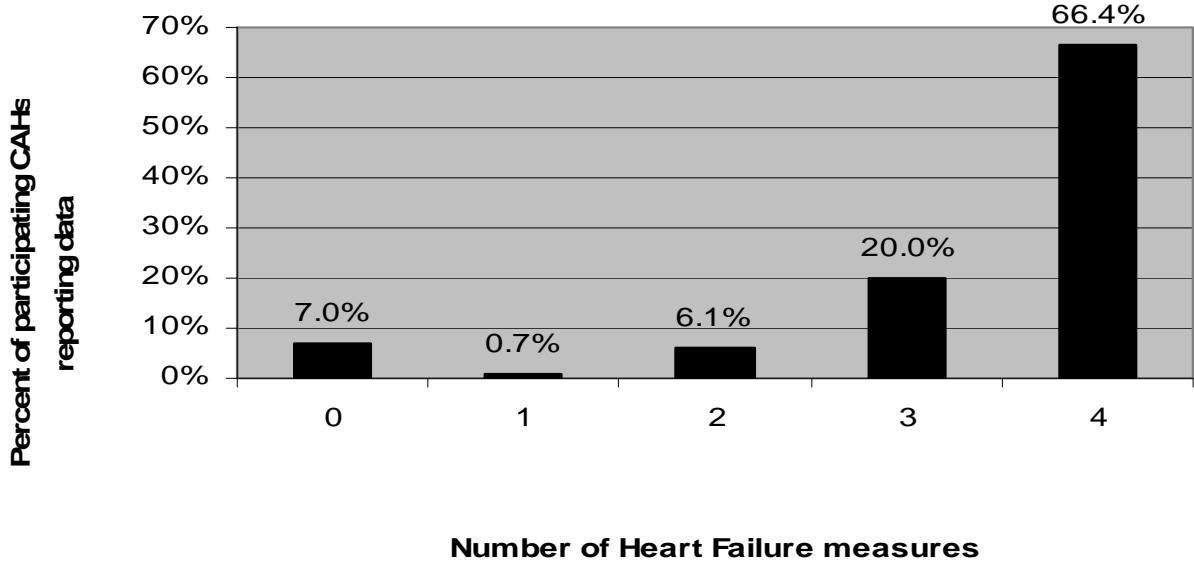


Figure 6. CAH Reporting of Pneumonia Measures for 2007 Discharges (N = 892 CAHs)

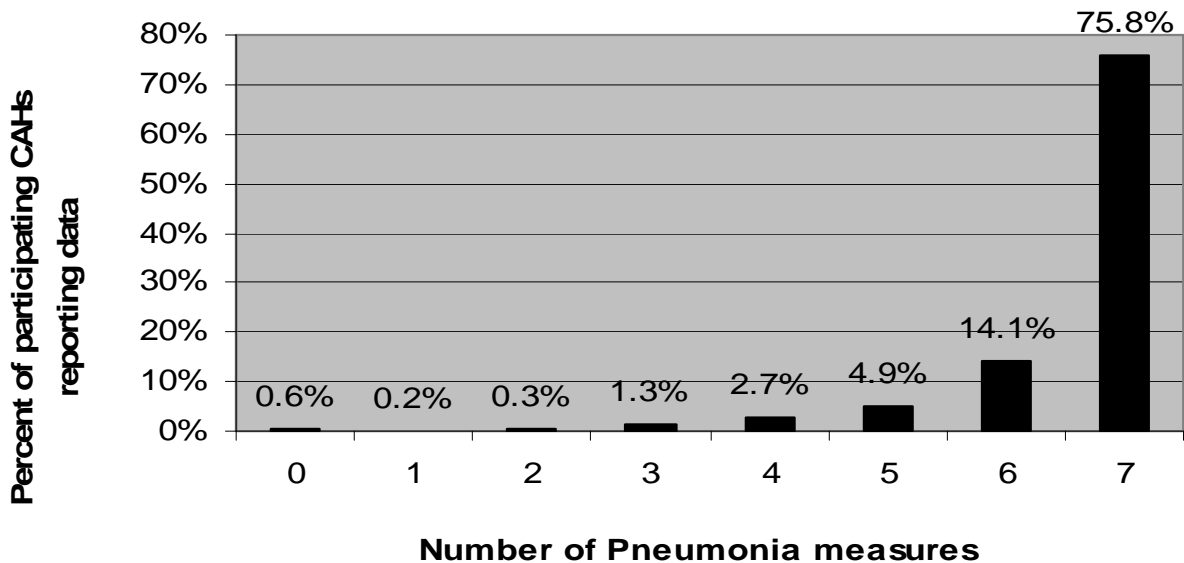
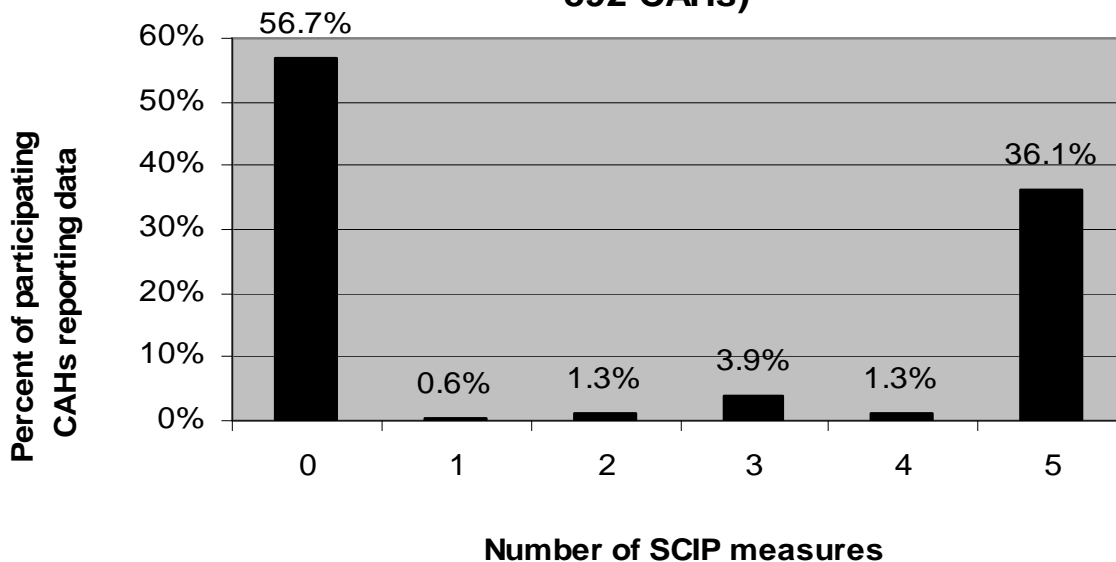


Figure 7. CAH Reporting of Surgical Care Improvement Measures for 2007 Discharges (N = 892 CAHs)



The number of CAHs reporting data and the number of patients for whom data are submitted varies widely across measures. For each measure, Table 3 shows the number of CAHs that reported data for one or more patients and for 25 or more patients.² Very few CAHs reported data for 25 or more patients on any of the AMI measures, two heart failure measures (ACE inhibitor/ARB for LVSD, smoking cessation advice), and two pneumonia measures (smoking cessation advice, influenza vaccination). The total number of CAH patients nationally per measure ranges from 134 for the AMI fibrinolytic measure to 38,462 for the pneumonia oxygenation assessment measure.

Table 3
CAHs Reporting and Number of CAH Patients by Measure for 2007 Discharges
(N = 892 CAHs)

Condition	Measure	Number of CAHs reporting data for ≥ 1 patient	Number of CAHs reporting data for ≥ 25 patients	Total number of CAH patients with data
AMI	Aspirin at arrival	513	8	2,756
	Aspirin at discharge	492	2	2,069
	ACEI or ARB for LVSD	236	0	415
	Smoking cessation advice	144	0	241
	Beta blocker at discharge	493	2	2,152
	Beta blocker at arrival	508	5	2,534
	Fibrinolytic w/in 30 minutes of arrival	84	0	134
Heart Failure	Discharge instructions	821	230	15,683
	Assessment of LVS	826	409	22,730
	ACE inhibitor or ARB for LVSD	718	13	5,062
	Smoking cessation advice	651	0	2,923
Pneumonia	Oxygenation assessment	886	616	38,462
	Pneumococcal vaccination	886	513	29,726
	Blood culture prior to first antibiotic	820	293	18,910
	Smoking cessation advice	844	59	8,848
	Initial antibiotic(s) within 6 hours	871	347	20,638
	Most appropriate initial antibiotic(s)	873	370	21,792
	Influenza vaccination	820	43	8,829
Surgical Infection Prevention	Preventative antibiotic(s) 1 hour before incision	380	200	15,061
	Received most appropriate preventative antibiotic(s)	380	201	15,093
	Preventative antibiotic(s) stopped within 24 hours after surgery	378	199	14,608
	Doctors ordered blood clot prevention treatments	365	210	15,755
	Received blood clot prevention treatments 24 hours pre/post surgery	365	209	15,742

² When a hospital has less than 25 patients for a measure, the number of cases is considered by CMS to be too small to reliably predict performance at the hospital level. As the number of cases used to determine hospitals' rates increases, the reliability and stability of the rates increase.

Comparison of Quality Results

The next section of the report compares the quality measure results for CAHs 1) by accreditation status and type of ownership and 2) with rural and urban PPS hospitals. Then, results are compared over the 2005-2007 time period for each group of hospitals.

As with our previous analyses of Hospital Compare data, several caveats are necessary in evaluating these results. Although the percent of CAHs participating in Hospital Compare has increased, participating and non-participating CAHs still differ significantly on several organizational characteristics (e.g., average number of beds, average daily census, accreditation status, type of ownership, and year of CAH certification). Thus, the quality measure results for CAHs that voluntarily participate in Hospital Compare may not be representative of all CAHs.

In comparing the results for CAHs with rural and urban PPS hospitals, it is important to recognize that hospital characteristics such as patient volume, the size and composition of medical and nursing staff, financial resources, and the availability of technology may influence the measurement of quality as well as the provision of care in the hospital environment. For measures that are rural relevant, comparisons of results across groups of hospitals can be a useful means of exploring the extent to which differences may be occurring due to factors related to patient volume or other aspects of the rural or urban environment.

Some differences between groups of hospitals are statistically significant because of the large sample sizes involved, but are only a few percentage points. These differences may not be of practical significance, especially if the percentages are high for all groups. Finally, it is also very important to remember that the aggregate scores for groups of CAHs, and PPS rural and urban hospitals include a wide range of scores for individual hospitals. Some individual hospitals in each group are performing much better than the average, and others are performing worse.

CAHs by Accreditation Status and Ownership

Table 4 compares the quality measure results for accredited and non-accredited CAHs. Differences between the two groups were not statistically significant for four measures. Four AMI, four heart failure, and six pneumonia measures were significantly higher for accredited CAHs while the five surgical improvement measures were significantly higher for non-accredited CAHs.

Table 5 compares the quality measure results for CAHs by type of ownership. The number of participating for-profit CAHs is small. Consequently, this group of CAHs had a total of less than 25 patients for three AMI measures and these data are not reported. Differences in the quality measure results for private non-profit CAHs and public/government owned CAHs were not statistically significant for six measures. The results for the remaining 17 measures were significantly higher for private non-profit CAHs. Differences between private non-profit CAHs and for-profit CAHs were not

Table 4
Percent of Patients Receiving Recommended Care in Accredited and Non-Accredited CAHs in 2007

Condition	Measure	Percent of Patients Receiving Recommended Care		Significance of differences between accredited and non-accredited CAHs
		Accredited CAHs (n=311)	Non-Accredited CAHs (n=578)	
AMI	Aspirin at arrival	90.2	89.1	NS
	Aspirin at discharge	89.2	84.4	<.001
	ACEI or ARB for LVSD	86.2	78.3	<.05
	Smoking cessation advice	81.8	66.7	<.01
	Beta blocker at discharge	89.2	86.0	<.05
	Beta blocker at arrival	85.8	84.8	NS
	Fibrinolytic w/in 30 minutes of arrival	47.6	37.0	NS
Heart Failure	Discharge instructions	71.4	57.3	<.001
	Assessment of LVS	79.5	72.3	<.001
	ACE inhibitor or ARB for LVSD	84.5	82.4	<.05
	Smoking cessation advice	84.2	71.9	<.001
Pneumonia	Oxygenation assessment	99.5	99.3	<.001
	Pneumococcal vaccination	81.3	75.3	<.001
	Blood culture prior to first antibiotic	90.3	90.7	NS
	Smoking cessation advice	85.2	69.1	<.001
	Initial antibiotic(s) within 6 hours	94.8	93.6	<.001
	Most appropriate initial antibiotic(s)	86.9	85.0	<.001
	Influenza vaccination	77.9	71.8	<.001
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	85.2	87.5	<.001
	Received appropriate preventative antibiotic(s)	91.3	94.1	<.001
	Preventative antibiotic(s) stopped within 24 hours after surgery	80.2	83.8	<.001
	Doctors ordered blood clot prevention treatments	81.2	83.9	<.001
	Received blood clot prevention treatments 24 hours pre/post surgery	79.9	82.3	<.001

NS = not significant

statistically significant for 12 measures. The results for the remaining eight measures were significantly higher for private non-profit CAHs. Differences between public/government owned CAHs and for-profit CAHs were not statistically significant for 11 measures. The results for five measures were significantly higher for public/government owned CAHs and for four measures for for-profit CAHs..

Table 5
Percent of Patients Receiving Recommended Care in CAHs by Ownership Type in 2007

		Percent of Patients Receiving Recommended Care			Significance of differences between:		
Condition	Measure	Public/Gov't CAHs (n=358)	Non-Profit CAHs (n=507)	For-Profit CAHs (n=27)	Public/Gov't and Non-profit CAHs	Non-Profit and For-Profit CAHs	Public/Gov't and For-Profit CAHs
AMI	Aspirin at arrival	86.2	91.3	90.1	<.001	NS	NS
	Aspirin at discharge	84.1	88.1	89.1	<.01	NS	NS
	ACEI or ARB for LVSD	82.2	83.0	*	NS	N/A	N/A
	Smoking cessation advice	81.6	72.7	*	NS	N/A	N/A
	Beta blocker at discharge	84.0	89.5	85.1	<.001	NS	NS
	Beta blocker at arrival	83.9	86.2	80.6	NS	NS	NS
	Fibrinolytic w/in 30 minutes of arrival	38.6	39.8	*	NS	N/A	N/A
Heart Failure	Discharge instructions	57.6	68.5	55.5	<.001	<.001	NS
	Assessment of LVS	70.6	79.1	64.9	<.001	<.001	<.001
	ACE inhibitor or ARB for LVSD	82.1	84.3	81.2	NS	NS	NS
	Smoking cessation advice	73.8	80.3	85.1	<.001	NS	<.01
Pneumonia	Oxygenation assessment	99.2	99.5	99.3	<.01	NS	NS
	Pneumococcal vaccination	73.2	80.6	79.7	<.001	NS	<.001
	Blood culture prior to first antibiotic	89.3	91.1	89.5	<.001	NS	NS
	Smoking cessation advice	71.6	80.6	83.7	<0.001	NS	<.001
	Initial antibiotic(s) within 6 hours	93.1	94.9	92.5	<.001	<.01	NS
	Most appropriate initial antibiotic(s)	84.1	87.2	81.9	<.001	<.001	NS
	Influenza vaccination	70.8	76.7	79.1	<.001	NS	0.01
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	84.4	87.1	71.6	<.001	<.001	<.001
	Received appropriate preventative antibiotic(s)	92.3	92.9	77.7	NS	<.001	<.001
	Preventative antibiotic(s) stopped within 24 hours after surgery	80.7	82.4	78.3	<.01	NS	NS
	Doctors ordered blood clot prevention treatments	81.1	83.0	74.7	<.01	<.01	<.01
	Received blood clot prevention treatments 24 hours pre/post surgery	79.9	81.4	72.9	<.05	<.01	<.01

*The total number of CAH patients nationally with data on this measure was less than 25.
 NS = not significant

CAHs and PPS Hospitals

Table 6 compares results for CAH patients with rural PPS patients nationally. Compared to rural PPS patients, the percent of CAH patients receiving recommended care in 2007 was not significantly different on four measures. The percent of CAH patients receiving recommended care was significantly lower than rural PPS patients on the remaining measures.

Table 6
Percent of Patients Receiving Recommended Care in CAHs and Rural PPS Hospitals in 2007

Condition	Measure	Percent of Patients Receiving Recommended Care		Significance of differences between CAHs and Rural PPS Hospitals
		CAHs (n=892)	Rural PPS Hospitals (n=993)	
AMI	Aspirin at arrival	89.7	95.2	<0.001
	Aspirin at discharge	86.9	94.8	<0.001
	ACEI or ARB for LVSD	82.9	89.6	<0.001
	Smoking cessation advice	75.9	96.6	<0.001
	Beta blocker at discharge	87.6	95.2	<0.001
	Beta blocker at arrival	85.3	91.4	<.001
	Fibrinolytic w/in 30 minutes of arrival	40.3	47.9	NS
Heart Failure	Discharge instructions	64.5	73.9	<.001
	Assessment of LVS	75.8	89.8	<.001
	ACE inhibitor or ARB for LVSD	83.5	86.6	<.001
	Smoking cessation advice	78.3	92.5	<.001
Pneumonia	Oxygenation assessment	99.4	99.5	<.001
	Pneumococcal vaccination	78.1	82.8	<.001
	Blood culture prior to first antibiotic	90.5	91.5	<.001
	Smoking cessation advice	77.5	90.7	<.001
	Initial antibiotic(s) within 6 hours	94.2	94.3	NS
	Most appropriate initial antibiotic(s)	86.0	86.7	<.01
	Influenza vaccination	74.7	77.5	<.001
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	86.3	87.9	<.001
	Received appropriate preventative antibiotic(s)	92.6	92.9	NS
	Preventative antibiotic(s) stopped within 24 hours after surgery	82.0	83.0	<.01
	Doctors ordered blood clot prevention treatments	82.4	84.5	<.001
	Received blood clot prevention treatments 24 hours pre/post surgery	80.9	81.1	NS

Compared to urban PPS patients nationally, the percent of CAH patients receiving recommended care in 2007 was not significantly different on one measure and significantly lower on the remaining measures (Table 7).

Some of the differences between CAHs and rural PPS hospitals, and between CAHs and urban PPS hospitals were statistically significant because of the large sample sizes involved, but the differences are not large enough to be of practical significance (e.g., the pneumonia measures, except for smoking cessation advice, and surgical improvement measures). The largest differences between the percentages were on the AMI and heart failure measures.

Table 7
Percent of Patients Receiving Recommended Care in CAHs and Urban PPS Hospitals in 2007

		Percent of Patients Receiving Recommended Care		Significance of Differences between CAHs and Urban PPS Hospitals
Condition	Measure	CAHs (n=892)	Urban PPS Hospitals (n=2,441)	
AMI	Aspirin at arrival	89.7	97.6	<.001
	Aspirin at discharge	86.9	97.5	<.001
	ACEI or ARB for LVSD	82.9	91.7	<.001
	Smoking cessation advice	75.9	98.3	<.001
	Beta blocker at discharge	87.6	97.4	<.001
	Beta blocker at arrival	85.3	95.1	<.001
	Fibrinolytic w/in 30 minutes of arrival	40.3	51.9	<.01
Heart Failure	Discharge instructions	64.5	77.0	<.001
	Assessment of LVS	75.8	95.9	<.001
	ACE inhibitor or ARB for LVSD	83.5	90.4	<.001
	Smoking cessation advice	78.3	95.9	<.001
Pneumonia	Oxygenation assessment	99.4	99.8	<.001
	Pneumococcal vaccination	78.1	83.4	<.001
	Blood culture prior to first antibiotic	90.5	90.8	NS
	Smoking cessation advice	77.5	93.8	<.001
	Initial antibiotic(s) within 6 hours	94.2	93.3	<.001
	Most appropriate initial antibiotic(s)	86.0	89.7	<.001
	Influenza vaccination	74.7	79.5	<.001
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	86.3	89.2	<.001
	Received appropriate preventative antibiotic(s)	92.6	94.1	<.001
	Preventative antibiotic(s) stopped within 24 hours after surgery	82.0	84.2	<.001
	Doctors ordered blood clot prevention treatments	82.4	86.7	<.001
	Received blood clot prevention treatments 24 hours pre/post surgery	80.9	82.4	<.001

Trends over Time for CAHs and PPS Hospitals

Figures 8-28 show the data trends for 2005, 2006 and 2007 for CAHs, rural PPS, and urban PPS hospitals. These data include all hospitals reporting in each category each year. The numbers of hospitals are listed in Table 8.

Table 8
Number of Hospitals with Data by Type from 2005-2007

Hospital Type	2005	2006	2007
CAHs	683	812	892
Rural PPS	1,003	1,004	993
Urban PPS	2,370	2,431	2,441

During the 2005-2007 time period CAH performance improved on all AMI measures (Figures 8-14). However, rural PPS and urban PPS hospitals, which each started out with better performance than CAHs, also improved their performance, thus the gap in performance between CAHs and PPS hospitals continued.

Similarly, for the heart failure measures (Figures 15-18), CAH performance also improved, but the gap in performance between CAHs and PPS hospitals continued, and for some measures increased (e.g., percent of heart failure patients receiving discharge instructions.)

Figures 19-25 show the three year trends for the pneumonia measures. For all three groups of hospitals, performance on the oxygenation measure has been very high. (CMS retired this measure, along with the heart failure beta-blocker on arrival measure, effective the second quarter of 2009.) Performance has improved for all three groups of hospitals and is now similar on three pneumonia measures related to receipt of antibiotics (Figures 21, 23 and 24). Performance is lower, but similar among all three groups on the influenza and pneumococcal vaccination measures (Figures 20 and 25). CAH performance on the pneumonia smoking cessation measure has improved, but remains well below rural and urban PPS hospitals (Figure 22).

CAHs made progress at closing the gap with rural PPS and with urban PPS hospitals on the percent of surgical patients who received preventative antibiotics within one hour before their incisions (Figure 26). For all three groups of hospitals, performance has improved slightly on the percent of surgical patients receiving the most appropriate antibiotics, a measure that was fairly high to begin with (Figure 27), and improved more on the percent of surgical patients whose preventative antibiotics were stopped within 24 hours after surgery (Figure 28).

Figure 8. Percent of AMI Patients Receiving Aspirin at Arrival 2005-2007

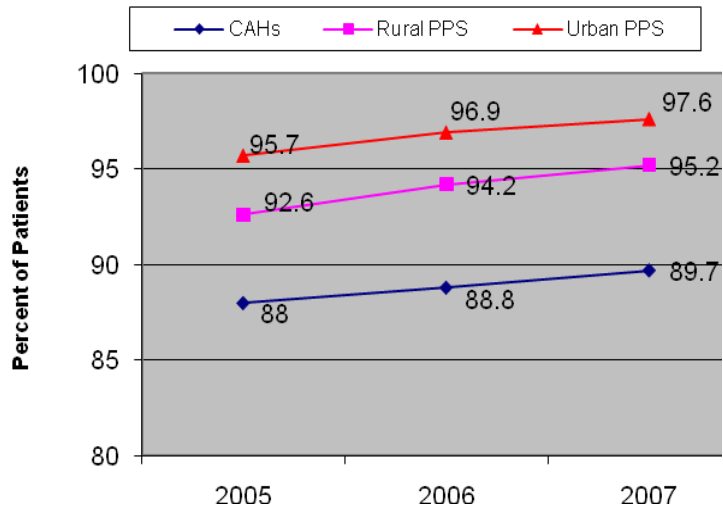


Figure 9. Percent of AMI Patients Receiving Aspirin at Discharge 2005-2007

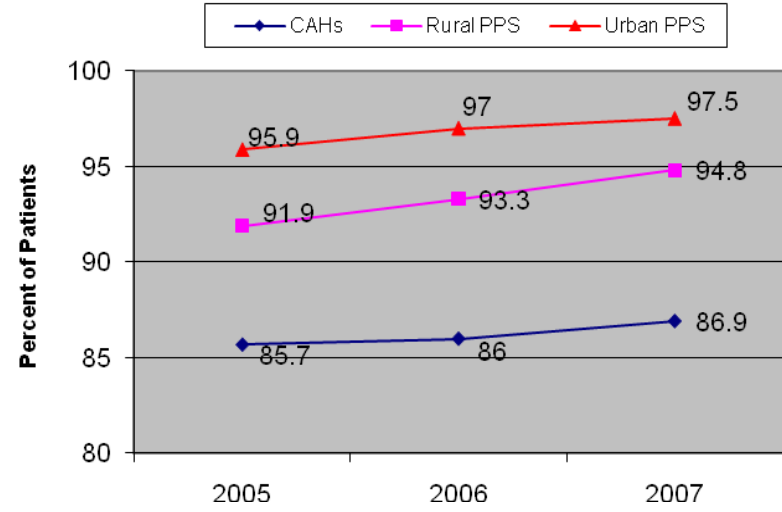


Figure 10. Percent of AMI Patients Receiving ACE or ARB for LVSD 2005-2007

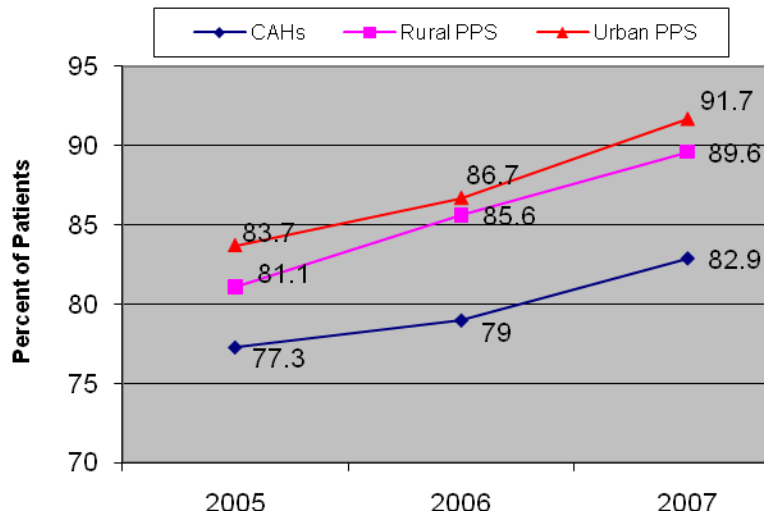


Figure 11. Percent of AMI Patients Receiving Smoking Cessation Advice 2005-2007

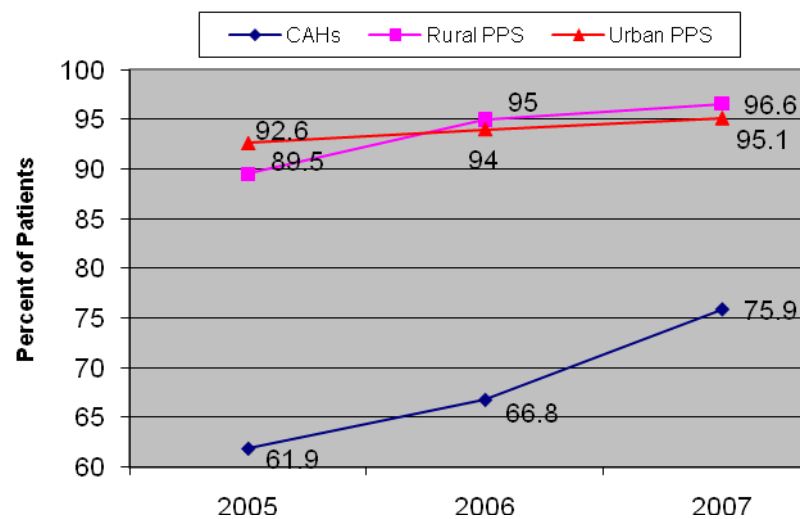


Figure 12. Percent of AMI Patients Receiving Beta Blockers at Discharge 2005-2007

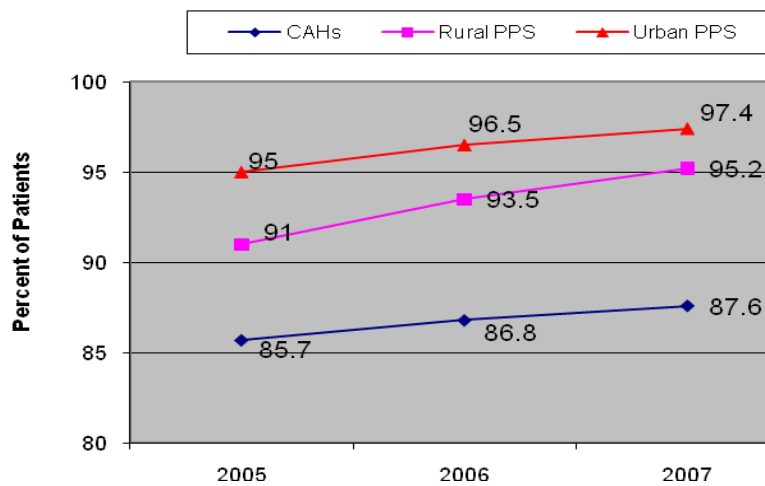


Figure 13. Percent of AMI Patients Receiving Beta Blockers at Arrival 2005-2007

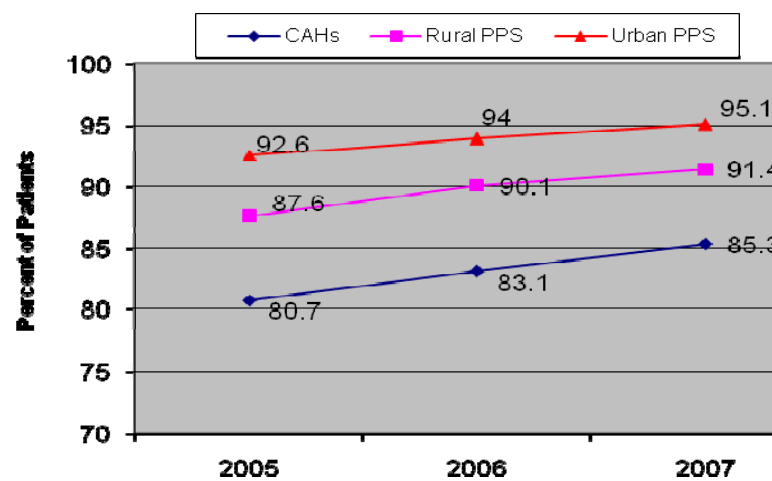


Figure 14. Percent of AMI Patients Receiving Fibrinolytic in 30 Minutes 2005-2007

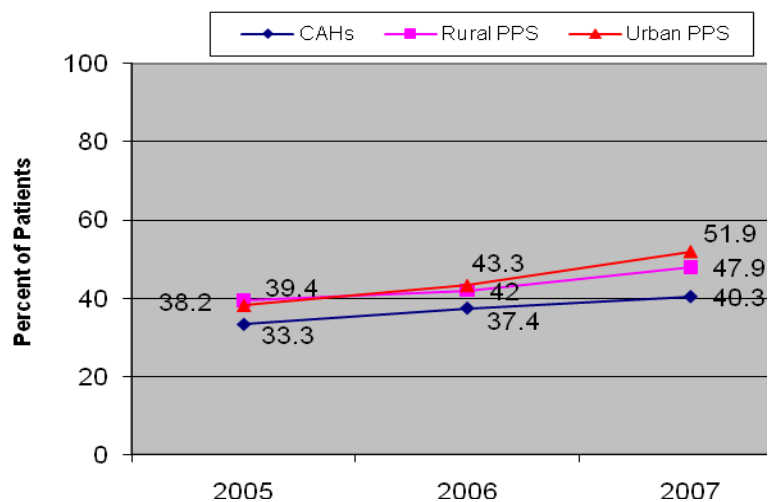


Figure 15. Percent of Heart Failure Patients Receiving Discharge Instructions 2005-2007¹

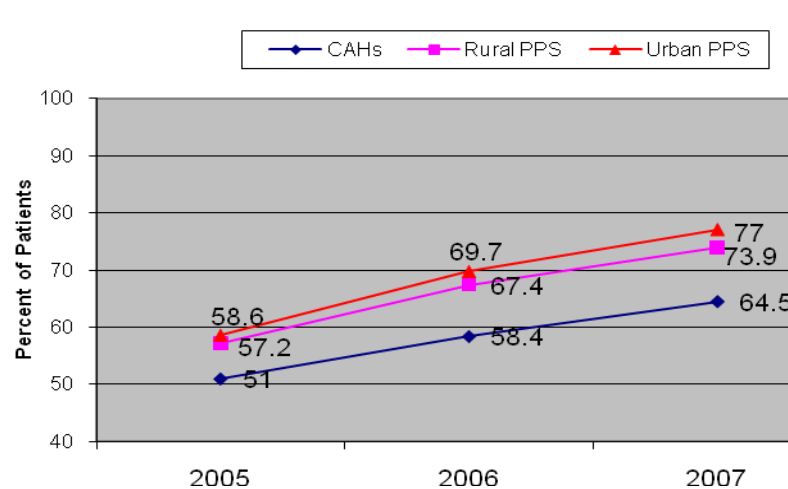


Figure 16. Percent of Heart Failure Patients Receiving Assessment of LVS 2005-2007¹

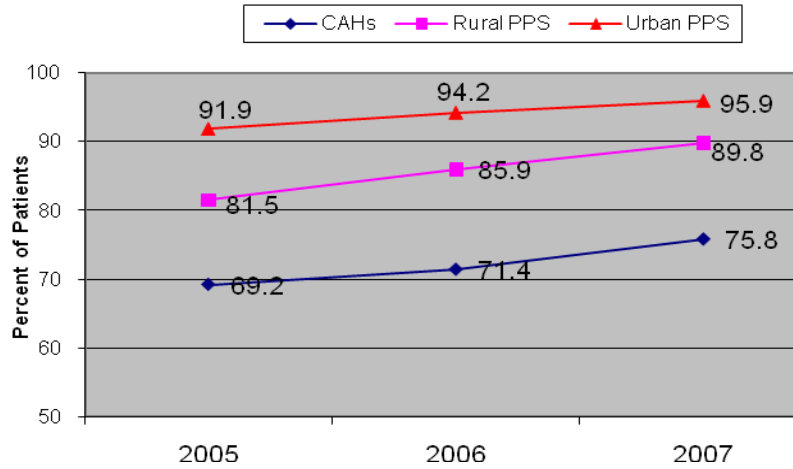


Figure 17. Percent of Heart Failure Patients Receiving ACE or ARB for LVSD 2005-2007¹

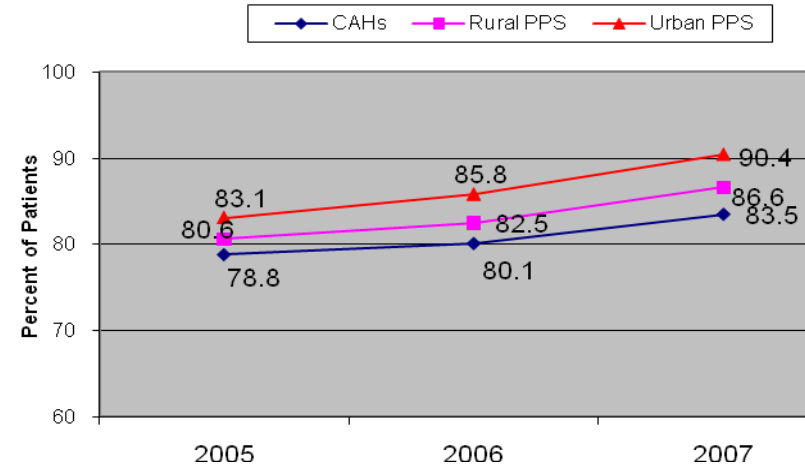


Figure 18. Percent of Heart Failure Patients Receiving Smoking Cessation Advice 2005-2007¹

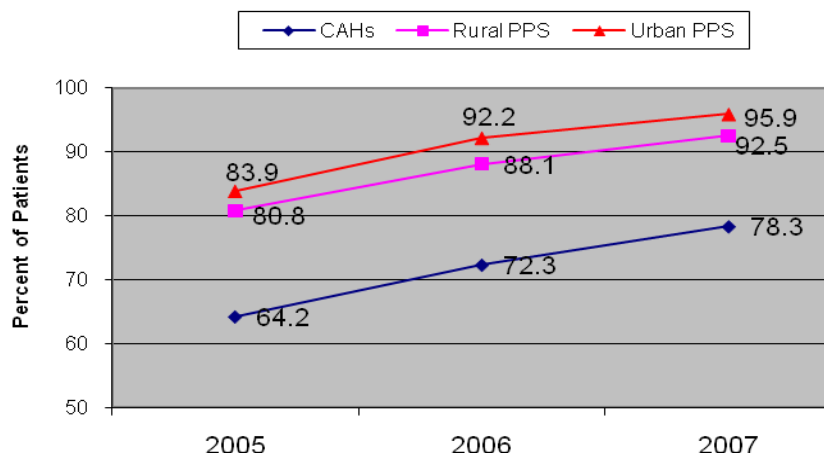


Figure 19. Percent of Pneumonia Patients Receiving Oxygenation Assessment 2005-2007

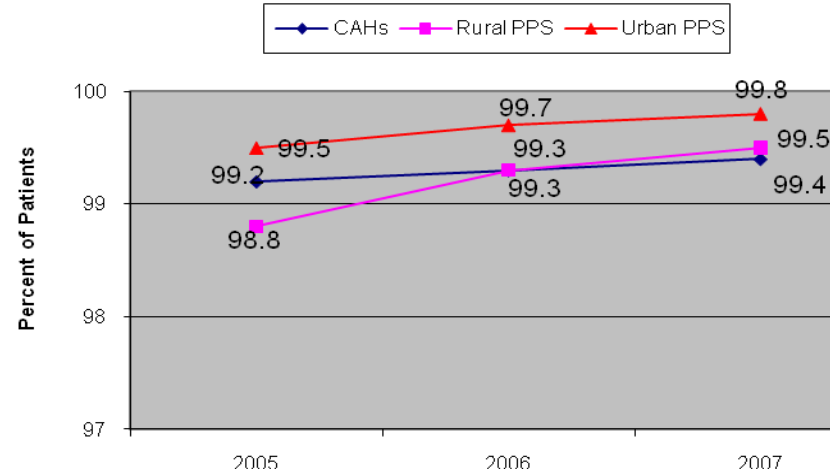


Figure 20. Percent of Pneumonia Patients Receiving Pneumococcal Vaccination

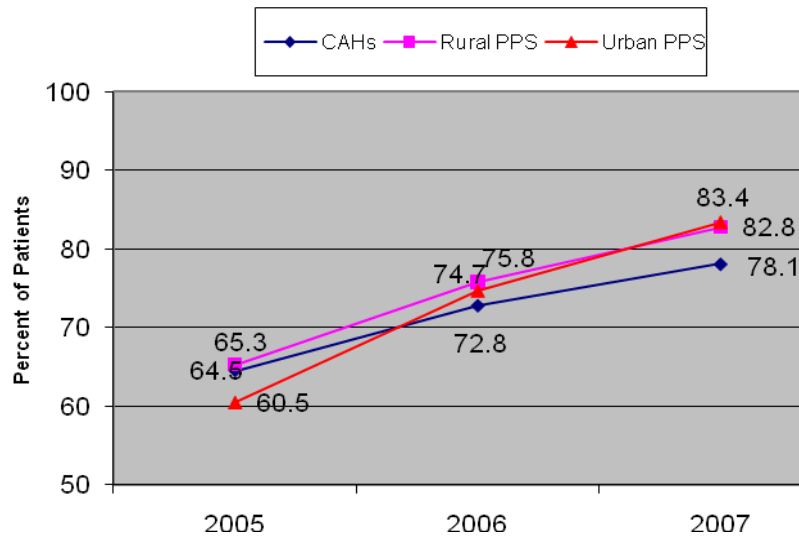


Figure 21. Percent of Pneumonia Patients Receiving Blood Culture Prior to First Antibiotic

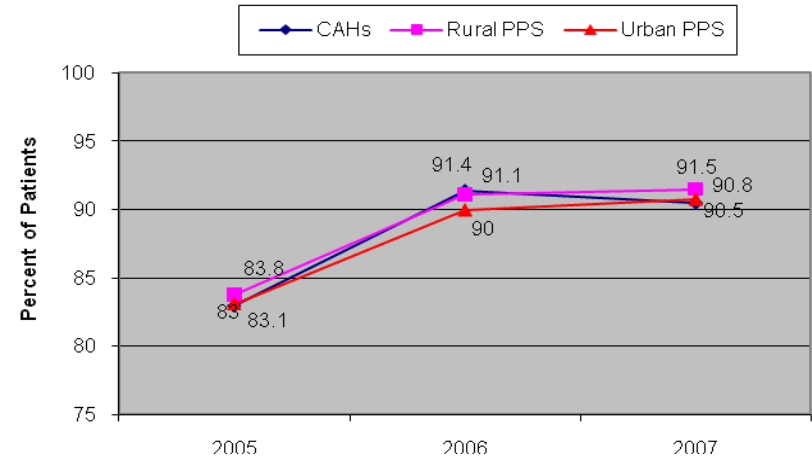


Figure 22. Percent of Pneumonia Patients Receiving Smoking Cessation Advice

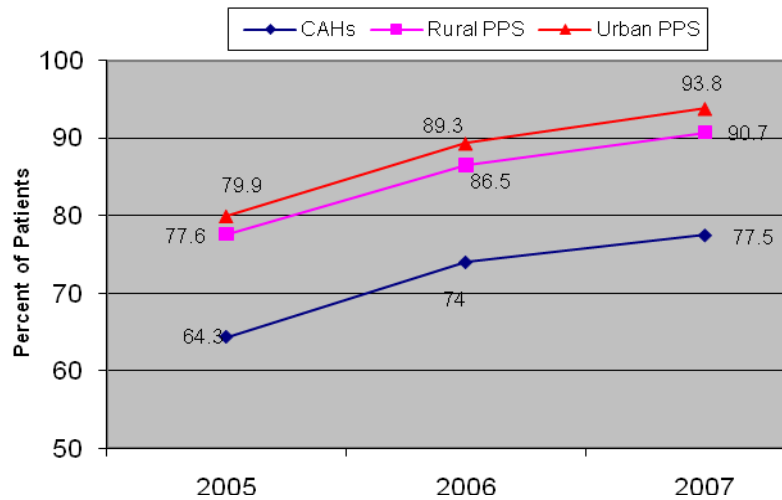


Figure 23. Percent of Pneumonia Patients Receiving Initial Antibiotic in 4/6 Hours

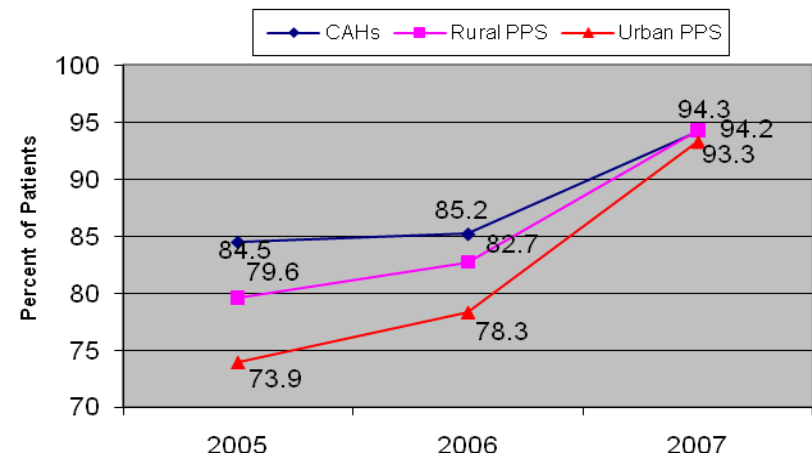


Figure 24. Percent of Pneumonia Patients Receiving Appropriate Initial Antibiotic

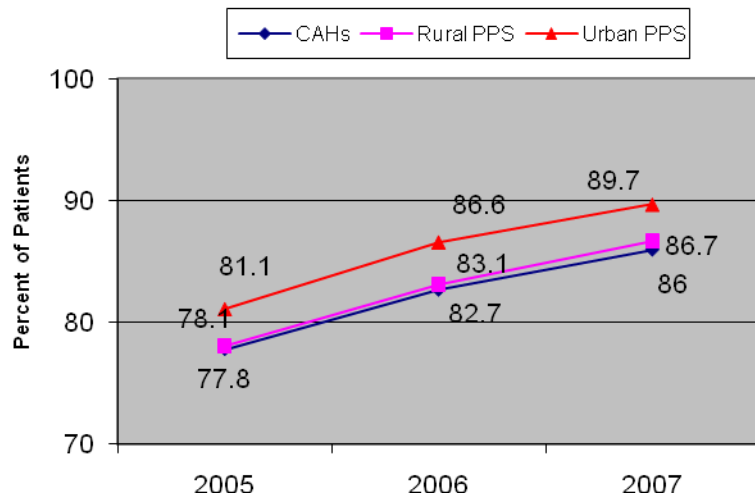


Figure 25. Percent of Pneumonia Patients Receiving Influenza Vaccination

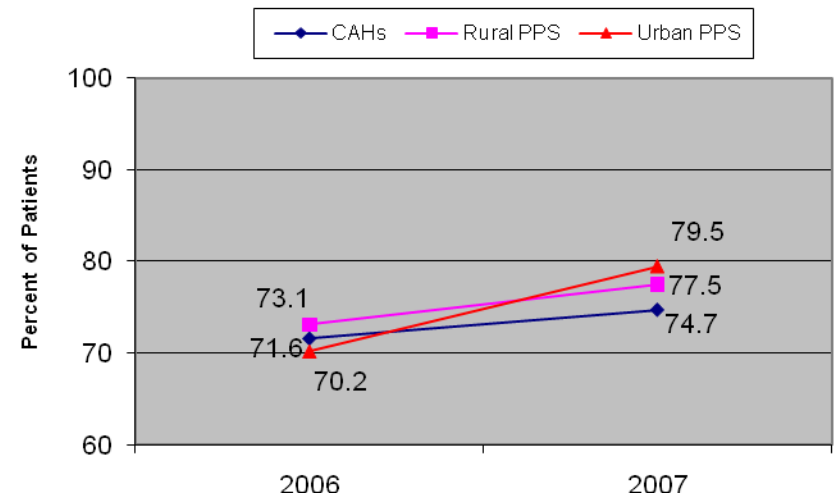


Figure 26. Percent of Surgical Patients Receiving Preventative Initial Antibiotic 1 Hour Before Incision 2005-2007

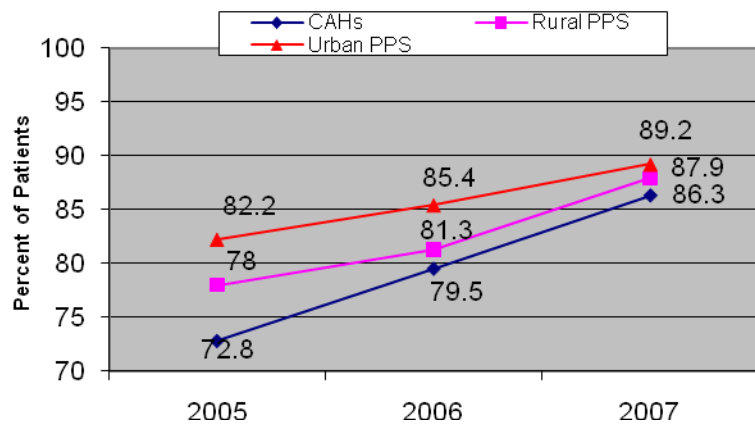


Figure 27. Percent of Surgical Patients Receiving Most Appropriate Antibiotic 2006-2007

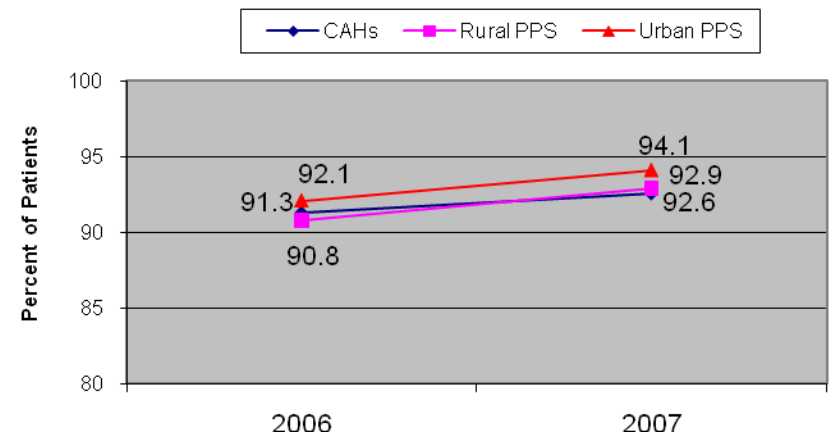
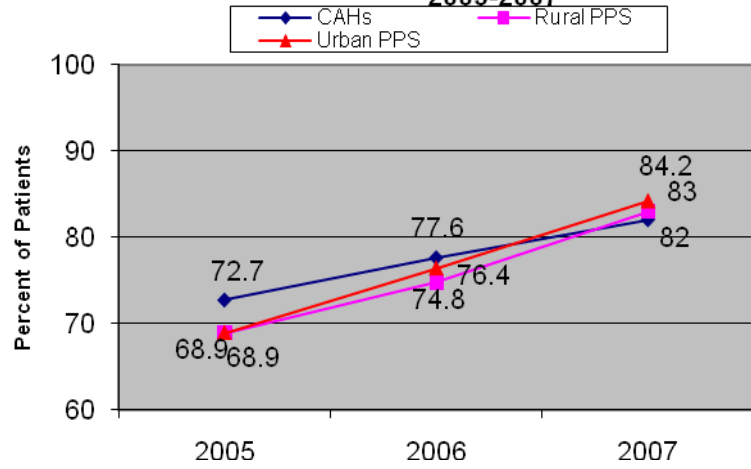


Figure 28. Percent of Surgical Patients with Preventative Antibiotic Stopped within 24 Hours 2005-2007



CONCLUSIONS

The Office of Rural Health Policy (ORHP) encourages state Flex programs to work with CAHs in their states on quality improvement, measurement and reporting. An explicit focus on quality improvement was included in re-authorization of the Flex program in the Medicare Improvement for Patients and Providers Act passed by Congress in July 2008 (H.R. 6331).

Over the past four years, CAHs have significantly improved their performance on nearly all Hospital Compare measures. At the same time, however, rural PPS and urban PPS hospitals also improved their performance. Thus, CAHs continue to have lower scores relative to rural and urban PPS hospitals on several measures, especially the AMI and heart failure measures. The persistence over time of significant differences between CAHs and PPS hospitals, especially for AMI and heart failure patients, as well as within the group of CAHs, presents an ongoing quality improvement challenge for CAHs.

CMS is continuing to add inpatient and outpatient measures to Hospital Compare. Some of the new and proposed measures address conditions that are commonly treated in CAHs (e.g., AMI Emergency Department/outpatient measures, HCAHPS patient assessment of care survey measures) while others address procedures not usually performed in CAHs (e.g., cardiac surgery). Future Flex Monitoring Team analyses will examine the extent to which CAHs are voluntarily reporting data on these new measures and assess trends in performance over time on all relevant measures.

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http://flexmonitoring.org/documents/BriefingPaper20_HospitalCompare3.pdf

Appendix A: ACRONYMS USED IN THIS REPORT

(CAH) Critical Access Hospital

A CAH is a facility that is designated as a CAH by the State in which it is located and meets the following criteria:

- Is a rural public, non-profit or for-profit hospital; or is a hospital that was closed within the previous ten years; or is a rural health clinic that was downsized from a hospital;
- Is located in a State that has established a State plan with CMS for the Medicare Rural Hospital Flexibility Program;
- Is located more than a 35-mile drive from any other hospital or CAH (in mountainous terrain or in areas with only secondary roads available, the mileage criterion is 15 miles) or be certified before January 1, 2006 by the State as being a necessary provider of health care services;
- Makes available 24-hour emergency care services 7 days per week;
- Provides not more than 25 beds for acute inpatient or swing bed care; and
- Provides an annual average length of stay of less than 96 hours per patient for acute care patients.

(Flex Program) Medicare Rural Hospital Flexibility Program

The Medicare Rural Hospital Flexibility Program (Flex Program) was authorized by section 4201 of the Balanced Budget Act of 1997 (BBA), Public Law 105-33. The Flex Program provides funding to States for the designation of critical access hospitals (CAHs) in rural communities and the development of networks to improve access to care in these communities. Under the program, hospitals certified as CAHs can receive cost-based reimbursement from Medicare.

(ORHP) Federal Office of Rural Health Policy

The Office of Rural Health Policy (ORHP) promotes better health care service in rural America. Established in August 1987 by the Administration, the Office was subsequently authorized by Congress in December 1987 and located in the Health Resources and Services Administration. Congress charged the Office with informing and advising the Department of Health and Human Services on matters affecting rural hospitals, and health care, co-coordinating activities within the department that relate to rural health care, and maintaining a national information clearinghouse. Additional information is available at <http://www.ruralhealth.hrsa.gov/>

(PPS) Prospective Payment System

Section 1886(d) of the Social Security Act sets forth a system of payment for the operating costs of acute care hospital inpatient stays under Medicare Part A based on prospectively set rates. Under the inpatient prospective payment system (PPS), each case is categorized into a diagnosis-related group (DRG). Each DRG has a payment weight assigned to it, based on the average resources used to treat Medicare patients in that DRG. The base payment rate is divided into a labor-related and non-labor share. The labor-related share is adjusted by the wage index applicable to the area where the

hospital is located. This base payment rate is multiplied by the DRG relative weight. Hospitals that treat a high-percentage of low-income patients receive a percentage add-on payment, the disproportionate share hospital (DSH) adjustment. Approved teaching hospitals receive a percentage add-on payment for each case paid through IPPS. Finally, for outlier cases that are unusually costly, the PPS payment is increased.

(QIOs) Quality Improvement Organizations.

Under the direction of CMS, the Quality Improvement Organization (QIO) Program consists of a national network of 53 QIOs, responsible for each U.S. state, territory, and the District of Columbia. QIOs work with consumers and physicians, hospitals, and other caregivers to refine care delivery systems to make sure patients get the right care at the right time, particularly patients from underserved populations. The Program also safeguards the integrity of the Medicare Trust Fund by ensuring that payment is made only for medically necessary services, and investigates beneficiary complaints about quality of care.

To achieve the vision of the QIO Program, the right care for every person every time, the Program assists providers in transforming quality to make healthcare: safe, effective, patient-centered, timely, efficient, and equitable. Through QIOs and End-Stage Renal Disease Networks, and in partnership with other stakeholders, the Program assists providers in transforming healthcare quality, and protects beneficiaries and the Trust Fund, using the following strategies: 1) measure and report performance; 2) adopt healthcare information technology and use it effectively; 3) redesign process; 4) transform organizational culture; and 5) beneficiary protection. Additional information is available at: <http://www.cms.hhs.gov/QualityImprovement-rqs/>